LEC – 10

Q-1 Using MATLAB commands:

Let

$$a = \begin{matrix} 0 & 1 & 1 & 0 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 0 & 1 & 1 & 0 \end{matrix} \quad and \quad b = \begin{matrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{matrix}$$

$$c = \begin{matrix} 1 & 2 & 3 & 4 \\ 1 & 2 & 3 & 4 \\ 1 & 2 & 3 & 4 \end{matrix} \quad and \quad k = \begin{matrix} 1 & 2 & 3 & 4 \\ 2 & 3 & 6 & 3 \\ 4 & 5 & 6 & 7 \\ 8 & 9 & 10 & 11 \end{matrix}$$

Find:

1. Find (b) from (a) Solution: $b = diag(max(a))$
2. Find (4*4) zero matrix of (a) Solution: $f = triu(a, 3)$
3. Find (c) from (a) with (k) Solution: $c = k(diag(a, 1), :)$

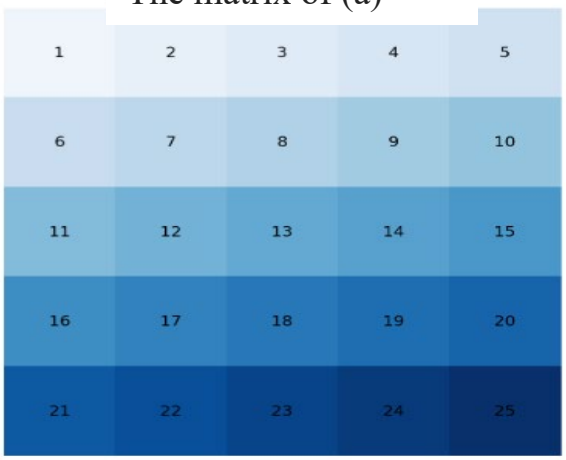
Q-2 *if*

$$a = \begin{matrix} 17 & 24 & 1 & 8 & 15 \\ 23 & 5 & 7 & 14 & 16 \\ 4 & 6 & 13 & 20 & 22 \\ 10 & 12 & 19 & 21 & 3 \\ 11 & 18 & 25 & 2 & 9 \end{matrix}$$

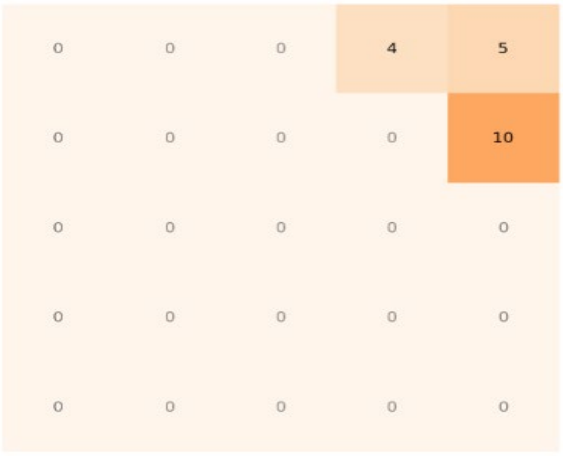
Find (4*4) zero matrix of (a) Solution: $f = triu(a,3)$

$$a = \begin{matrix} 0 & 0 & 0 & 8 & 15 \\ 0 & 0 & 0 & 0 & 16 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{matrix}$$

The matrix of (a)



triu(a, 3)



ملاحظة: فإن triu(a,3): ستعيد فقط العناصر الواقعة على القطر الثالث فوق القطر الرئيسي وما بعده، والباقي سيكون أصفارًا

Q-3 $if \quad a = [1\ 2\ 3\ 4\ \ 5;$

$6\ 1\ 2\ 3\ \ 4;$

$7\ 8\ \ 2\ 1\ \ 3;$

$9\ \ 10\ 11\ \ 3\ \ 2;$

$4\ \ 5\ \ 6\ \ 7\ \ \ \ 1];$

And

$k = [100\ 101\ 102;$

$200\ 201\ 202;$

$300\ 301\ 302;$

$400\ 401\ 402;$

$500\ 501\ 502;$

$600\ 601\ 602;$

$700\ 701\ 702;$

$800\ 801\ 802;$

$900\ 901\ 902;$

$1000\ 1001\ 1002];$

Find $c = k(diag(a, 1), :)$

Solution:

$$d = diag(a, 1)$$

القطر الأول فوق الرئيسي يحتوي على:

1. a(1,2) = 2
2. a(2,3) = 2
3. a(3,4) = 1
4. a(4,5) = 2

$$then \quad d = [2;\ 2;\ 1;\ 2]$$

$$c = \begin{matrix} 200 & 201 & 202 \\ 200 & 201 & 202 \\ 100 & 101 & 102 \\ 200 & 201 & 202 \end{matrix}$$

Q-4 $Let\ \ a = \begin{matrix} 3 & 3 & 3 \\ 2 & 1 & 2 \\ 3 & 3 & 3 \end{matrix}$ and $b = \begin{matrix} 27 & 27 & 27 \\ 4 & 1 & 4 \\ 27 & 27 & 27 \end{matrix}$

$$v = [3 \quad 6 \quad 6 \quad 3]$$

1. $Find \quad (b) \quad from\ (a)$
2. $from\ (a)\ and\ (b) \quad find \quad (v)$

Solution:

1. $W = power(a, a) \quad \Longrightarrow W = \begin{matrix} 27 & 4 & 27 \\ 27 & 1 & 27 \\ 27 & 4 & 27 \end{matrix}$
2. $v = [length(a), length([a, b]), length([b, a]), length(b)]$

Q-5 Write a program to read n real numbers and find the number and sum of numbers that contain decimal digits.

Solution:

```
clear;
 clc;
clear;
close all;
n=input('n=')
s=0;
r=0;
for i=1:n
  x=input('x=')
      if abs(x) > fix(abs(x))
s=s+x;
r=r+1;
       end
end
disp([s,r])
```

Q-6 Write a program to find the sum of the elements of a matrix and the sum of the elements of each row of a matrix consisting of 2*2.

Solution:

```
clear;
clc;
close all;

for i=1:2
    for j=1:2
        a(i,j)=input('a=')
    end
end
ss=0;
for i=1:2
    s=0;
    for j=1:2
        s=s+a(i,j)
    end
end
    disp(s)
    ss=ss+s
    disp(ss)
```

Q-7 Write a program to find the sum of each column (sum(a)).

Solution:

```
clear;
clc;
close all;

      n=input('n=')
      m=input('m=')
 for i=1:n
    for j=1:m
      a(i,j)=input('a=')
   end
end
for k=1:m
   s=0;
    for L=1:n
       s=s+a(L,k);
end
  b(L,k)=s
  end
   disp(b)
```